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New York

1912

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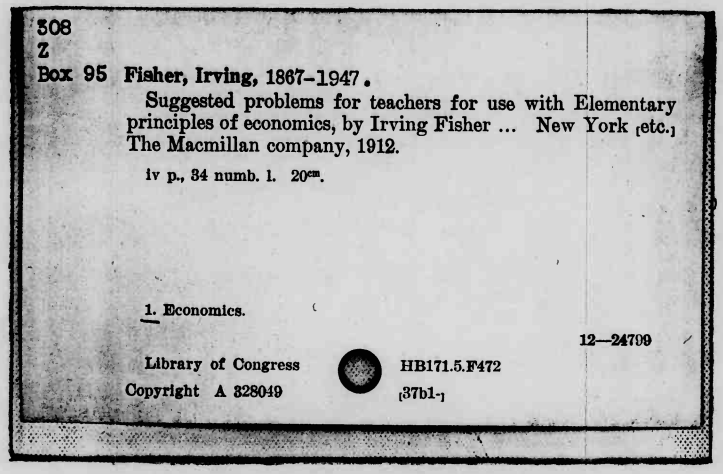
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SUGGESTED PROBLEMS FOR TEACHERS

FOR USE WITH

ELEMENTARY PRINCIPLES OF ECONOMICS

BY

IRVING FISHER

Professor of Political Economy, Yale University

New York
THE MACMILLAN COMPANY
LONDON: MACMILLAN & CO., LTD.
1912

By Professor IRVING FISHER

Elementary Principles of Economics

Cloth, 12mo. $2.00 net

THE words "Elementary Principles" in the title of this book indicate the limits of its scope; the book is intended to be elementary, not advanced, and concerns itself with economic principles, not their applications.

First, being elementary, it does not attempt to unravel the most difficult tangles, of economic theory or to introduce controversial matter. . . . Secondly, being devoted to principles, the book is confined to that part or aspect of economics which is now coming to be recognized as capable of scientific treatment in the sense, for instance, in which that term may be applied to physics or biology. . . . The aim of this book is to formulate some of the fundamental principles relating to economics. . . . It takes due account of those ideas with which the student's mind is already furnished, and builds on and transforms these ideas in a manner adapted to the mind containing them. This is especially needful where the ideas are apt to be fallacious. The economic ideas most familiar to those first approaching the study of economics concern money,— personal pocket money and bank accounts household expenses and income, the fortunes of the rich. Moreover, these ideas are largely fallacious. Therefore, the subject of money is introduced early in the book and recurred to continually as each new branch of the study is unfolded. For the same reason considerable attention in given to cash accounting, and to those fundamental but neglected principles of economics which underlie accounting in general. Every student at first is a natural "mercantilist," and every teacher has to cope eventually with the prejudices and misconceptions which result from this fact. Yet no textbook has apparently attempted to meet these difficulties at the point where they are first encountered, which is at the beginning.

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PREFACE

These problems aim to test and strengthen the student's knowledge of the *Elementary Principles of Economics*. For this purpose care has been taken to make them as *definite* as possible. The vague problems common to most textbooks have been studiously avoided, in the belief that they encourage mere expression of opinion by the student instead of an effort at careful and exact thinking.

The problems may either be assigned in advance, to be prepared by the student *out* of the classroom, or may be discussed, without previous preparation, *in* the classroom. I am inclined to think that, in general, the best arrangement is to assign, for outside work, the more difficult problems as "optionals," giving special credit for their correct solutions, and to reserve the simpler problems for impromptu discussion in the classroom. By such a discussion it is easy to capture the attention and interest of many students who would endeavor, out of the classroom, to shirk the task of independent thinking.

For extemporary work I believe the best results will be secured by holding the student responsible for the correct solution of the simpler problems. They then serve as a severe test of knowledge of the text. When the student once understands that he must be ready to solve such problems at sight he will be stimulated to study the textbook not with the object of memorizing the words or reciting in a parrot-like way but in order to obtain such a sure grasp and mastery of the subject as will enable him to recognize and apply the principles involved in the many aspects and disguises in which they appear in the problems.

It was to enable the teacher to give his students such "sight work" that these problems were collected in a separate pamphlet and not printed in the textbook itself.

The problems are framed so as to suggest to the teacher many other similar ones to be constantly varied and adapted

to local circumstances, current topics and particular questions introduced from time to time by the students themselves. Blank pages have been provided in order to enable the teacher to jot down such additional problems. (I should be greatly obliged if teachers would send me such new problems,—for instance by lending me their annotated copies of this pamphlet.) The pamphlet should thus serve as a mere source book or note book, the problems themselves being constantly changed and never allowed to become stale or stereotyped. This is another reason why a separate pamphlet was preferred to problems printed in the textbook itself. Such problems soon become stale to the teacher, from yearly repetition, and to the student, from loss of applicability to current events. They are also apt to lose even their character as problems; for their solutions often become matters of record in second-hand editions of the textbook and in "digests" or "keys" prepared by enterprising students for their fellows.

I am indebted to various collections of problems, including the late Professor William G. Sumner's *Problems in Political Economy*, New York (Henry Holt), 1888, Professor Frank A. Fetter's *Principles of Economics*, New York (The Century Company), 1904, Professor H. J. Davenport's *Exercises in Value Theory*, Chicago (University of Chicago Press), 1908, *Outlines of Economics*, by members of the Department of Political Economy of the University of Chicago (University of Chicago Press), 1910, and Professor F. M. Taylor's *Principles of Economics*, University of Michigan, Ann Arbor, Michigan, 1911. I have indicated these sources by the initial letters *S*, *F*, *D*, *O*, *T*, respectively.

I am still more indebted for suggestions and criticisms to my colleagues: Professor Clive Day and Assistant Professor F. R. Fairchild and to some of my graduate students, especially Mr. J. M. Shortliffe, Mr. Alden Anderson and Mr. Ray B. Westerfield.

IRVING FISHER.

August, 1912.

SUGGESTED PROBLEMS FOR TEACHERS

Ch. I. § 1

Is air under ordinary conditions wealth?

Is the air in a hot house wealth?

Is the air confined in a diving bell wealth; in one's nostrils; lungs; in a pneumatic tire?

Is the water flowing from a spring by the roadside wealth? (*T.*)

Is a cup of water taken from the spring wealth? (*T.*)

Are fish wealth; all fish? If not, distinguish which are and which are not.

Is a domesticated dog wealth; a wild animal in the jungle; in a menagerie?

Is an autograph of Benjamin Franklin wealth?

Are the following wealth: an ocean steamship; a ship on the bottom of the ocean; gold in a mine; gold in the moon; gold, to a shipwrecked sailor on a desert island; gold in teeth; false teeth; natural teeth; health; eye-sight; an amiable disposition; a waterfall; a head full of useful knowledge? (*O.*)

Ch. I. § 2

It is said that many Chinamen come to the United States, make money and return to China with it. Do you think this tends to impoverish the United States?

[For other questions on money fallacies see Chapter XIV, end.]

Ch. I. § 3

Classify, under the scheme of Chapter I, § 3, the following articles of wealth: iron ore, Brooklyn Bridge, Yellow-

stone Park, toll-gate, a city lot, a railway station, track, fence, flax, bread, canned goods, play ground, growing corn, axe, thread, locomotive, slave, cash-book, money metal, money, battleship, baseball.

Is a serf wealth; an indentured servant; a negro held in peonage; a laborer?

Divide wealth into two classes according to its origin; according to its relation to the consumer; according to its being traded in; according to durability; according to the uses to which it is put; according to its bulk; according to its importance to the welfare of a nation; according to its age; according to any other principle of classification which occurs to you.

Ch. I. § 4

With what unit would you measure the following articles of wealth: slaves, carpet, gold, diamonds, champagne, wheat, wheat land, growing-wheat, plants, horses, oil?

How would you measure the quantity of wealth in your room? Would one unit suffice? If not, how many? Make a rough inventory. If you wished to be very exact, would you need to employ a greater number of units? If so, would these units have to be more carefully characterized than in the rough measurement?

Ch. I. § 5

How would you attempt to ascertain the price of sugar; unclaimed umbrellas left at a railway lost-property office; unredeemed diamonds in a pawn shop; building land in a city; land in a public park; houses in a row, all alike; the White House; sail boats; the Olympic; battleships?

If a bicycle is stolen and never recovered, in what sense does it belong to the thief? *De jure? De facto?* If it is sold by the thief and bought by an innocent purchaser,

does it belong to the new owner *de jure* as well as *de facto?* Do you suppose much of the land and other articles of wealth now in existence was, in the course of its previous history, stolen or otherwise wrongfully acquired?

Ch. I. § 6

If a *quantity* of 243 bushels of wheat is sold at a *price* of $1.10 per bushel, what is the *value?*

If an appraiser puts a *value* of $10,000 on a 250 acre farm, what *price* does this represent?

If sugar to the *value* of a dollar's worth is bought at a *price* of seven cents a pound, what is its *quantity?*

Ch. I. § 7

A man died leaving an estate which his adminsitrators inventoried at the following valuations:

Residence	$10,000
10 R. R. bonds at $1015	10,150
Cash	123.16
Total	$20,273.16

The appraisers say that the residence may be worth a thousand or two more or less than the figure ($10,000) at which it is entered. The price of the railway bonds is known to be correct within $5, while the cash is absolutely correct. How accurate is the total, $20,273.16?

Ch. II. § 1

What benefit is rendered by a bushel of wheat; a sack of flour; a loaf of bread?

What benefit is rendered by a furnace; a ton of coal; a heating register; a thermostat; a storm window; a policeman; a lawyer; a judge; a teacher; a clergyman?

Ch. II. § 2

What costs, if any, are there in getting water from a spring? What costs at first in getting water from a proposed new municipal water system? From this system after it is built? What costs to the user of water who draws it from a faucet? Any cost to him in money?

Ch. II. § 3

Make a diagram to show the interest which a tenant has who has leased a building for five years, occupancy to begin six months from date.

Make a diagram to show the interest which the owner of a "season ticket" to the opera has.

If an ocean steamship company brings an immigrant to America under an agreement by which he is to pay for his passage out of future earnings, does the company partially own the immigrant?

What is selling one's self into slavery? If a man is hired by the day, how much of a claim has his employer on him? How much has he on his employer?

Benefits are classified as past and future. Why not make a third class of "present"?

Suppose a case where a railway company pays its president $200,000 in return for which, without further compensation, the president agrees to work ten years. To what extent does the railway company own the president?

If, instead, he is paid a salary of $25,000 a year, state the claims and counterclaims involved.

When a professional baseball player is "sold" for a particular ball nine, what is the nature of the transaction?

When a voter sells his vote, to what extent is he owned by another?

Ch. II. § 4

A buys a typewriter from X, paying cash $100. B rents the typewriter from A for one month. During the

month C occasionally hires the typewriter from B for an hour at a time. Explain, using diagram, the property right of A, B, and C, each, in the typewriter.

A buys a ticket for a trip to Europe on the "Olympic." What (if any) in this case constitutes wealth; services; property; certificate of property right; cost?

If you buy a ticket to a football game, what property right do you acquire? What is its evidence? To what benefits does it entitle you? What articles of wealth yield these benefits?

It is sometimes said that a man who promises to deliver in the future what does not yet exist, has nothing behind his promise. Is this true (*a*) if he is "good" for his promise; (*b*) if not? Suppose wheat is the wealth in which the promissor is to make good his promise. Is it the future object, or is it something in the present? If so, what?

In the safes of lower Manhattan are concentrated millions of stocks and bonds; does this fact increase the wealth of lower Manhattan? By the amount of the stocks' and bonds' par value? Market value? By how much and why?

A canal has become inadequate for demands made by traffic. Agitation is started for the improvement of the canal. A railway corporation, fearing competition if the canal is improved, buys it, the purpose being to allow the canal to fall into disuse. No income will be derived from the canal. In order to raise the necessary funds, a bond issue is floated. What is the wealth underlying the bonds?

Sometimes "subscription books" are subscribed for in advance of being published or even written.

Suppose the subscription is not prepaid, but is to be paid on delivery of the book; what claim then has the book company on the subscriber?

In what way, if at all, will the case be different if an agent of a magazine secures subscriptions to take the magazine

and pay for it when the bill is presented. If the promise is not written, in what way will the case be different?

In what way will the case be different if next year the subscriber refuses to make an absolute promise to renew his subscription, but gives assurance that he *probably* will do so?

In what way will the case be different if no assurance is asked, but the publisher of the magazine relies merely on past experience and counts on the renewals from three-fourths of his subscribers? What is the nature of this property-right? If he sells his newspaper, including rights to probable renewals, what are these rights called? Are they "good will"?

Show the relation of good will to promises.

[A similar series of questions may be asked with reference to patent rights and other obscure cases of property, seemingly independent of wealth. See *Nature of Capital and Income*, Chapter II.]

Ch. II. § 5

Classify, the following under wealth, property, certificates, services, qualities of wealth, or non-economic elements: The overtures performed by an orchestra; the overture as a composition (Is it an economic magnitude?); the overture as a printed musical score; a baseball game; a whiff of fragrance from a buttonhole bouquet; the ribbon of the Legion of Honor; a Ph.D. degree; a union label; a trademark; the electric current through a wire; a liquor license; political "influence" with a legislature; a trade secret; a police permit to pick pockets? What is obtained in return for a nickle dropped in the slot of a weighing machine?

Ch. II. § 6

Suppose a farm worth $10,000 is mortgaged for $6,000. If the mortgage is taxed, ought the farm to be taxed too, and if so, how?

Ch. III. § 1

Are wages a stock or a flow?
Is a moving picture exhibition capital or income?
Are the films capital or income?

Ch. III. § 2

A student owns books worth $100; clothes, $100; furniture, $50; typewriter, $75; bank account, $200; cash, $25; ticket to a ball game, $2. He owes Farmer Jones $30; the tailor $40; and the typewriter dealer $35. Make up the student's capital account.

If, immediately after the last balance sheet in Ch. III, § 2, is made up, a dividend of 10% (on the original capital) is paid, show how the assets and liability items will be affected.

Ch. III. § 3

Make out an imaginary balance sheet for two dates, showing a growth of capital-balance and indicating the under-valuations in certain specific items of assets to explain the discrepancy between the bookkeeper's and the market valuation.

Ch. III. § 4

Suppose among the assets of a concern is a note for $10,000 of a bankrupt who can pay only 40 cents on the dollar. Show what changes should on this account be made in the balance sheet.

Ch. III. § 5

Suppose the person whose balance sheet we are considering himself fails and can only pay 75 cents on the dollar. What effect will this have on the valuation put on his debts? Illustrate, by figures, the change produced in the balance sheet.

Ch. III. § 6

Make up an imaginary balance sheet of a joint stock company. What difference, if any, would it make whether the company be regarded as consisting of its stockholders or as a fictitious entity owing the stockholders?

Ch. III. § 7

Make up the capital account for each of the following persons, and combine them by the method of balances and by the method of couples:

(*a*) Smith owns a farm worth $10,000; cattle and horses, etc., $1000; machinery, $1500; buildings and improvements, $5000; railway shares, $500; Brown's note, $500. He has given Jones a note for $1000 and his farm is mortgaged to the extent of $3000.

(*b*) Jones owns goods in a dry goods store worth $25,000; house and lot, $10,000; automobile, $2000; bank shares ("stock"), $4000; Smith's note, $1000. He owes Brown, as per note, $2000; has overdrawn his bank account to the extent of $5000; and his house and lot are under mortgage for $2000.

(*c*) Brown owns a stable worth $5000; horses, $10,000; carriages, etc., $15,000; furniture, $2000; Jones' note, $2000; stock in a trolley line, $3000; bank deposit, $5000. He owes Smith, as per note, $500, and his stable is mortgaged for $1000.

Ch. III. § 8

Suppose A's balance sheet is as follows:

Assets		Liabilities	
Tangible goods	$10,000	Debts due B	$5000
Shares in U. S. Steel Corporation	10,000		
	$20,000		$5000
Capital Balance	$15,000		

Do those items imply relations between A and other persons, whether real or fictitious? If so, what other persons? Make up illustrative accounts of these other persons. If these accounts imply relationship with still other persons, then make up the sheets of these also and proceed until both sides of every debt and credit is represented. Then cancel by the method of couples. Does any debt and credit item remain among the uncancelled items?

Ch. III. § 9

Does recapitalizing a company at a larger figure (watering its stock) add to the wealth of the country?

Does the issue of $100,000,000 bank notes by banks, by which they stipulate to pay that sum on demand, add $100,000,000 to the wealth of the country?

Ch. IV. § 1

Is the money which a wage earner has been paid and which he is carrying home Saturday night capital? Is it income? Is it outgo? Is money ever income; outgo? What is "money-income"; "money-outgo"? Are expenses outgo? Are expenses money or the parting with money?

Are the apples on a tree income or capital? Are the apples which fall from the tree income or capital? Is the yielding of the apples by the tree as the apples fall to the ground income or capital?

Ch. IV. § 2

Describe the outgo and income of an automobile from the time it is bought to the time it is sold second-hand, using illustrative figures for each successive year.

Ch. IV. § 3

How would these figures be altered if the automobile were paid for in installments and when resold were again paid for in installments?

Ch. IV. §§ 4 and 5

A capitalist receives dividends of $5000 a year which he puts, as they come in, into a strong box. Out of it, in the course of a year, he takes $4000 for food, clothing, etc., and other living expenses.

Is the receipt of $5000 in dividends income, outgo, or capital? If income, income from what? Is the deposit of $5000 in the strong box income, outgo, or capital? If outgo, outgo occasioned by what? Is the payment of $4000 out of the box for living income, outgo, or capital? If income, income from what? If outgo, outgo occasioned by what? Is the use of the food, clothes, house, etc., for which the $4000 is paid income, outgo, or capital? If income, income from what? Are the contents of the strong box income, outgo, or capital the food in the pantry; the clothes worn?

Ch. V. § 1

When an apple falls from a tree into the stock of apples on the ground beneath; what is the interaction? What is the "acting" (*i. e.*, yielding) capital? What is the capital acted on? How then credit and debit? Is there any net income from the orchard as a whole?

Express the credits and debits when money is taken out of one pocket and put into another.

Ch. V. § 2

When water is pumped into a tank what is the interaction? What capital is credited? What debited? When coal is screened; when wheat is reaped; when potatoes are dug; when fish are caught?

Ch. V. § 3

Into how many stages may we divide the transportation of coal from one city to another? At each stage indicate the credits and debits involved.

Trace the interactions—of transfer, transformation, transportation—connected directly with some article of your breakfast table, such as sugar, coffee, meat, eggs, etc., following it from the original processes of production to its final consumption.

Ch. V. § 4

A man enters a store, asks for a dollar's worth of sugar, and is handed a package. Thereupon he hands it back saying, "I'll change my mind; give me a dollar's worth of tea instead." Receiving the tea, he starts to go out of the store. The storekeeper calls him back, saying, "You didn't pay for the tea." "Oh! yes I did," he replies, "I gave you back the sugar." "But," persists the storekeeper, "you didn't pay for the sugar." "No," replies the man, "but I didn't take the sugar!" Explain this "flim flam" in terms of the debits and credits involved.

Ch. V. § 5

An exchange consists in four items in all, two of which are debits and two of which are credits. Show these four items when A buys $10 worth of wheat from B for a note? On account?

A paper "trust" owns great forest lands; cuts its timber; floats the logs to pulp mills; and turns them into pulp and the pulp into paper. Draw up a table showing the chief interactions.

Ch. V. § 6

Copy table on page 86 in the center of a large sheet and insert other items in the "outgo" column, such as payment of wages, rent, interest, etc., and introduce the other sides of the interactions thus introduced and the other capital items to which they relate. For this purpose make other tables on either side of the original. Then

make the cancellations of interactions by drawing a line through each pair of mutually cancelling items and note what items are left.

Ch. V. § 7

We have seen that it is not correct to infer that in every trade the one who parts with the money is a loser and only the one who receives it a gainer. Is it correct to conclude that neither party gains, since each receives and parts with equal values which cancel themselves out? If not, is it nevertheless correct to cancel those values against each other?

Suppose the government should compel every mortgage to be paid off at once. Make a table showing how the balance sheets of the mortgagor and the mortgagee would be affected. Would this compulsion bring hardship? Would it affect the wealth of the community? How?

Suppose the government should compel all booksellers to stop business. Make income and outgo accounts to illustrate the contrast between what would have been without such interference and what will happen with such interference. Would this compulsion bring hardship? Would it affect the income of the community? How?

Ch. V. § 8

Add to the account in § 8 of the dry goods company other items to include rent paid for hired premises, use of one's own premises, payment of interest, wages, etc. [See *Nature of Capital and Income*, p. 160, etc.]

Ch. V. § 9

Add to the table in § 9 the items which would be involved if we consider " food " as producing an interaction on " self " (in the consumption of food) and " self " yielding the thus resulting *satisfactions*. [See *Nature of Capital and Income*, p. 174, ff.]

Ch. V. § 10

Is dancing labor? Is the dancing of a dancing-master labor? If he "would rather dance than eat," is it labor? (*F.*)

Ch. VI. § 1

Suppose a loan of $100 at 5% for ten years. Show how this loan might be expressed in terms of a number of separate contracts by which a perpetual annuity is bought and sold. Show how it may be expressed in terms of ten year-to-year contracts by which a sum of money in one year is exchanged for another sum the next year.

Ch. VI. § 2

What is the amount of $3.00 at 3% for 3 years?

Assuming the same rate of interest, what is the present worth of $200 due in two years?

Ch. VI. § 3

Suppose the sum of $52 is due in 1920. Compute its "present value" in 1919 if the rate of interest is 4%; if the rate is 6%; if 3%. Compute its "present value" in 1918 at 4%; at 6%; at 3%. Compute its "present value" in 1917 at 4%; at 6%; at 3%.

Draw a "discount curve" representing the above three results. Which curve is the steepest?

Ch. VI. § 4

A $1000 "three per cent" bond falls due in two years. What is its present value if the actual rate of interest is 3%; if 6%?

Draw the tooth-like curves for the above two cases.

Ch. VI. § 5

Verify by computation the values given in the last two columns of page 125 for the "land" and "the suit of

clothes " and " the loaf of bread." Carry out the calculation for " the suit of clothes " more exactly than is given in the book.

Indicate by arithmetical formulae the method of working out the same results for the " house " and the " horse.'

Calculate all the values in the last two columns if the rate of interest is zero.

Ch. VII. § 1

What is the value of a property which yields $100 the first year, $200 the second, and $300 the third (and nothing more), if interest is 5%?

What is its value at the end of the first year just before the $100 is received? Just after?

What is its value at the end of the second year before and after the $200 is received? The third year in both cases?

Make a table showing the complete history of its value, its appreciation or depreciation, and the interest accrued each year.

Ch. VII. § 2

Express, by means of formulae, the process of deriving *all* of the figures in the table on page 130 and work it out in detail for the " suit of clothes."

Given interest at 5% and given an income of $1, $10, $100 due respectively 1 year, 2 years, and 3 years from date, work out the history of the capital value from the present time onward and show each year what is " interest accrued," " appreciation " or " depreciation," and " rate of income taken out."

Take as your example a loaf of bread and fill out columns of table on page 130.

Ch. VII. § 3

The savings of the people of the United States are nearly a billion dollars a year. What and where are they? (*F.*)

"The old-fashioned notion that capital is built out of savings has little or no application under our régime of corporate organization. What happens nowadays is that the corporation simply puts some portion of its huge earnings into improvements such as buildings, machinery, side-tracks, etc., so that saving is no longer required."

(*a*) Show that the modern method as expressed in the second sentence involves no essential change in procedure.

(*b*) Show that this modern procedure may involve, probably does involve, not a few cases of really onerous saving. (*T.*)

Ch. VII. § 4

Assuming a rate of interest of five per cent, find what annual income in perpetuity is the equivalent of the following:

(1) An immediate payment of $200.
(2) A payment of $20 a year for ten years and then $400.
(3) A payment of $1050 one year hence.
(4) A payment of $300 one hear hence.
(5) A payment of $300 two years hence.
(6) A payment of $5 a year for ten years and then $102.
(7) A payment of $5 a year for ten years and then $98.
(8) A payment of $50 a year for three years.
(9) A payment in four successive years of $5, $10, $8, $3.

Ch. VII. § 5

A man insures his life for $1000 for a premium of $20 a year. Describe the asset and liability thus created for the insurance company. Will they be equal to each other? What two reasons why the liability is not appraised at $1000. We may assume that the rise of death increases each year while the premium remains

at $20, so that the $20 at first more than covers the risk. Show what happens, as a consequence, to the relative value of the asset and liability as time goes on.

Ch. VIII. § 2

If a gold dollar be melted, is it still money? Do you know of any times and places in which uncoined gold was money? Is a postage stamp money? Is a street railway coupon, good for a five cent ride, money? Is the warehouse receipt for $100,000 deposited in the vaults of a safety deposit company money? Is the "gold certificate" of the United States Government (which is simply a warehouse receipt for gold coin deposited in the vaults of the United States) money? Strictly speaking, is it the written certificate or the right it represents which is money? Is an old Roman coin still money?

What objections would you see in the use of any of the following as money: wheat, diamonds, sulphur, iron, ivory, ostrich plumes, lead?

Ch. VIII. § 3

In the example given in the text, suppose that the volume of money doubles while its velocity and the quantities of goods exchanged remain unchanged, but that, through some special cause, the price of bread is prevented from rising while the price of coal doubles; show what must happen to the price of cloth.

In the same example, suppose that the volume of money is doubled and the velocity of circulation increased by 50%, while the quantities of goods exchanged remain unchanged; show what will happen to the price level.

In the same example, suppose that the quantity of money increased 25%, its velocity 20% and the volume of trade 50%; what will happen to prices?

From the equation of exchange, show how to express the price level; *i. e.*, $P = ?$

Ch. VIII. § 5

Express in algebriac formulae P as an average of the p's and T as the sum of the Q's. What kind of an average is P?

Suppose that in the year 1900 the prices of various goods are p_0, p_0', p_0'', . . . and the quantities Q_0, Q_0', Q_0'', . . . respectively; and that, in the year 1912, the prices and quantities are p_1, p_1', p_1'', . . . and Q_1, Q_1', Q_1'', . . . Let the price level (P_0) for 1900 be called 100% or 1. Write

(1) the formula for T_0, the volume of trade for 1900.

(2) the formula for T_1, the volume of trade for 1912, as the total value which the quantities for 1912 would have *at the prices of 1900*.

(3) the formula for P_1, the price level for 1912.

[See *Purchasing Power of Money*, Ch. X and Appendix.]

Ch. IX. § 1

Suppose one depositor who owes another $5000 gives him a note for $5000 and the recipient sells the note to the bank for money. What is the effect on the balance sheet on page 171? If, instead of taking cash for the note, he accepts a credit of $5000, against which he can draw at will, what will be the effect on the balance sheet?

Ch. IX. § 2

Have the above operations increased the world's wealth by $5000? Have they increased the world's currency?

Ch. IX. § 4

Not many years ago it was estimated that the *per capita* money circulation of England was about $11 while that of France was about $51; yet there was at least as much business *per capita* carried on in England as in France. How could the difference in the amounts of circulating medium be explained? (*T.*)

In the United States in 1909 M was about $1\frac{2}{3}$ billions of dollars; M', $6\frac{2}{3}$ billions; V, 21 times a year; V', 54. Calculate (1) the total money expended; (2) the total checks drawn against deposits; (3) the grand total of expenditures. What then was the total value of the goods bought?

Assume as our unit for measuring the volume of trade (T), the *quantity of goods worth a dollar in 1909*. What is the *price* of each kind of goods? What is the average price (P)? What is the total number of " units " in the volume of trade (T)?

In 1911 M was about 13 billions; M', 8 billions; V, 21; V' 50; while T had increased 7%. What, then, was T in 1911. What was P? How much has P changed since 1909? On the basis of the above figures how do you explain this change in the price level?

Ch. IX. § 5

Suppose that in a given community in the course of time (by a change in banking laws, or otherwise) the average ratio of reserves to deposits subject to check should be changed from 20% to 10%. Show the effect on the quantity of money in circulation, on the volume of deposits and on the price level. Assume that the ratio of money in circulation to deposits subject to check remains 1 to 5.

Solve the problem again, assuming that the ratio of money to deposits does not remain constant, but changes from a ratio of 1 to 5 to a ratio of 1 to 7.

Ch. X. § 2

It is shown in the book that the lender loses by depreciation. Would he not also lose if instead of " lending his money," he should " keep his money "? Show the money fallacy lurking in these phrases by distinguishing between keeping

actual money and " keeping money invested " in land, factories, and other wealth. Show the difference between " keeping his money invested " in stocks and keeping it invested in bonds.

Ch. XI.

Suppose the trade unions in the building trades should force up the prices of all building materials, buildings, and labor in these industries; would they have any influence on M, M', V, V', or T? If not, could their action have any effect on P? If not, what must be the effect on other prices than those which they raise?

Suppose the steel trust raises the price of steel. Will this necessarily raise the general level of prices? Explain.

In what ways is it possible that the general level of prices may be raised by the steel trust?

Does failure of the wheat crop tend to raise the price of wheat? Does it tend to raise the price level? If so, in what way? What, if any, connection is there between the influence of the crop failure on the price of wheat and its influence on the price level?

What effect does an increase in middlemen have on the prices paid by the consumer; on the prices received by the producer; on the general level of prices?

What do you think are the chief effects on prices of shortening the hours of labor?

Trace the effects on the price level of

(1) The accruing of a surplus in the United States Treasury.
(2) A deficit in the same.
(3) The admission of new stocks (*i. e.*, of new corporations) to the stock exchange.
(4) Increase in the leisure classes.
(5) " High living."
(6) Extension of market.
(7) Immigration of the Jews.

(8) Exhaustion of productivity of the soil by unscientific farming.
(9) Abolition of truck system of paying employees.
(10) The " Black Death," 1348–51.
(11) Invention of the telegraph.
(12) Practice of paying money by telegraph.
(13) Development of business accounting.

Ch. XII. § 1

If, instead of duties on imports into the United States, there should be laid duties on exports, show what would be the effect on the level of prices in the United States?

If duties were laid on both imports and exports so that the net effect on M were nil, what would be the effect on P?

Suppose that we had a depreciated and irredeemable currency so that no money would be either imported or exported; what then would be the effect of a protective tariff on the general price level? On the prices of imported articles? On the prices of other articles?

Ch. XII. § 2

If a " seigniorage " were reëstablished at the mint, what would be its effect on the price level and why?

If the governments should limit the coinage of gold, what would be the effect on the price level and why?

Ch. XII. § 3

If governments should control the gold mines and reduce their output, what would be the effect on the price level and why?

Ch. XII. § 4

If gold were demonetized, would it retain its full former value as bullion? Show mechanically what would happen.

Ch. XIII. § 5

Suppose, under bimetallism, that gold became exhausted while new discoveries of silver were made. Discuss the effect on the stability of bimetallism and on the purchasing power of money.

Discuss these effects when new discoveries of both metals are simultaneously made.

Ch. XIII. § 6

It is said that during the Civil War money was abundant and yet gold was very dear. Would the expulsion of gold by the greenbacks tend to cheapen gold? Reconcile your answer with the "dearness" of gold.

Given the limping standard and falling prices (*i. e.*, an increase in the purchasing power of money, *i. e.*, a falling level of the surface of the contents of the money reservoirs) how could the government, by exercising its discretion in coining silver, tend to arrest the movement? If it should continue to pursue this policy in the face of a continued fall of prices, what would ultimately happen to the amount of gold in circulation? What monetary system would result? Would the regulation of the purchasing power of money so as to prevent or mitigate its changes be economically desirable. Would it be politically desirable to allow an official to exercise discretion in buying and coining silver.

Suppose prices to be rising. In what ways could the currency be contracted? Discuss their desirability.

Ch. XIV. § 3

Write the formula for the simple arithmetical average of 7 and 8.

Write the formula for the weighted arithmetical average of 7 and 8 when the weights are 2 and 3.

The simple geometrical average?

The weighted geometrical average?

The simple harmonic average?

The weighted harmonic average?

Answer the same questions when the numbers to be averaged are a and b and their weights A and B. Suppose three numbers; four.

The median of any given series of numbers is the *middle* number, *i. e.*, a number such that half of the given numbers are greater and half smaller. If the series contains an even number of numbers and the two middle ones are not equal to each other, the median is usually taken as their arithmetical mean.

With these definitions, find the simple averages, arithmetical, geometrical, harmonic and median, of 1 and 2. Find the weighted averages when the weights are 3 and 4. Work out the same problems when the numbers are 7, 8, 9, the weights being 1, 2, 3.

Suppose bread, coal and cloth have the price ratio given on page 251 (bottom) in 1909 and 1912, but that the quantities exchanged were the same in both years, say 20, 50 and 30. Show that a properly weighted arithmetical average of the index numbers for 1912 will give exactly the same value of PT for 1912 as ΣPQ. Show that none of the other averages mentioned (geometrical, etc.) would do this.

What kind of average would you take for the "average velocity of circulation of money for the United States" if one billion dollars turn over 25 times in the Eastern States; a half billion in the Western States, 20 times; and a sixth of a billion in the Southern States, 10 times. Show what the *time* of turnover is in the three districts and the average time of turnover for the United States. [The proper average velocity is a weighted arithmetical average and the proper average time is a weighted harmonic average.]

Ch. XIV.

GENERAL REVIEW PROBLEMS ON MONEY FALLACIES

"I don't see that society as a whole loses anything by the giving of a fireworks exhibition costing $1000. Of course the people who pay for the fireworks are just so much out. But then the $1000 goes to the other people who furnish the fireworks; so that society as a whole comes out even." Criticise. (*T.*)

"My numerous armies promote the circulation of money, and disburse impartially among the provinces the taxes paid by the people of the state." Frederick the Great justifying his wars in a letter to D'Alembert. (Quoted from Bullock.)

Was there anything in the facts stated to offset the sacrifices undergone by the people in paying the taxes? (*T.*)

A Western newspaper, anxious to hinder the people of the community from buying outside, represents a silver dollar as appealing to a home dentist about to send it to Montgomery Ward & Co. of Chicago, in the following strain:

"Now look here, Doc. If you'll only let me stay in this town, I'll circulate around and do you lots of good. You buy a big beefsteak with me, and the butcher will buy groceries, and the grocer will buy dry goods, and the dry goods merchant will pay his doctor bill with me, and the doctor will spend me with a farmer for oats to feed his buggy horse, and the farmer will buy fresh beef from the butcher and the butcher will come around to you and get his tooth mended. In the long run, you see, I will be more useful to you here at home than if you send me away forever."

(*a*) Clear up the fundamental errors in all talk of this kind.

(*b*) Show, even if we admit the principle implied in the quotation (that only the money spent at home can

complete the circuit so as to get back to the original spender), *only a very small portion* of the dollar could get back to the dentist. (*T.*)

" It is sometimes asked whether the raising of a government loan to cover ordinary expenditures really causes capital to be lost, since the coins received by the government remain in existence,—even remain in the country. *This objection has no weight whatever.*" Pierson's Principles of Economics.

Show that the statement in italics is correct. (*T.*)

The government of the island of Guernsey having no ready funds issued paper-notes to pay for the building of a market. They circulated and were gradually taken up as the market earned its cost, during ten years. When they were all redeemed and burned the island had the market. Was it free of cost? Explain the nature of the transactions involved. (*F.*)

" A wise government will never let a dollar in money go out of the country; for, as every dollar spent by an individual makes him so much poorer, so every dollar paid out by the country to other countries makes the first country so much the poorer."

(*a*) In what sense must the word " spent " be understood to make the case of the individual and the country parallel?

(*b*) When used in this sense, is it true that every dollar spent by the individual makes him so much poorer? (*T.*)

From a Salt Lake supporter of the " Seeing America " movement: " We recognize that Americans are annually spending $200,000,000 in foreign travel. That practically every dollar of this vast sum is lost to the home circulation cannot be disputed."

Criticise the last sentence. (*T.*)

" We pay 110 million dollars per annum for the carrying of products between this and foreign countries. Think

of it. One hundred and ten million dollars in gold coin has gone out of the commerce of this country into the commerce of other countries. Can New York stand this?" James G. Blaine in 1881.

(*a*) Is it likely that we permanently lost 110 million dollars in gold from our circulation because we hired foreigners to carry our goods?

(*b*) Is it likely that we even temporarily parted with that much gold on that account?

(*c*) Is it likely that as a nation we should have been richer if we had done this carrying of products for ourselves? (*T.*)

"The annual influx of students and other outsiders into the fruit belt to engage in fruit picking and packing is an abuse which should be stopped at once. These people consume very little, saving their money to take back to Chicago and the other places from which they came. Thus, while making large sums off us, they give little or nothing to the support of our industries." Criticise. (*T.*)

Ch. XV. § 2

Why is it that the same kind of shares may be sold simultaneously on the same stock exchange at different prices? Could these different prices be *widely* different? Could they be *permanently* different? Why?

Ch. XV. § 3

Are supply and stock on hand the same? Does stock include the portion in the hands of consumers? Does supply? Can stock ever exceed supply. Can supply ever exceed stock? Does it in the case of sales for future delivery? (*O.*)

Suppose that, as regards a certain kind of rare coin, A would buy one at $100; B, one at $90; C and D, one each at $80; E, F, and G, one each at $60. If, now, seven are

to be disposed of in a competitive market, what will the price be? Does cost of production affect the situation? (*O.*)

Frame a demand schedule for salt and for diamonds.

Ch. XV. § 5

Draw and discuss supply and demand curves in which

(*a*) The demand is elastic and the supply, elastic;
(*b*) The demand is elastic and the supply, inelastic;
(*c*) The demand is inelastic and the supply, elastic;
(*d*) The demand is inelastic and the supply, inelastic;

by supposing (1) the demand curve and (2) the supply curve to shift.

Ch. XVI. § 1

Continue the curves in Fig. 30 for higher prices up to $12 as given in the schedule above it. Continue them still further by supposing figures in the schedule for prices higher than $12. Continue them, at the other ends, by supposing figures in the schedule for prices lower than $2, down to zero. What is meant by demand at a zero price? Suppose prices below zero and extend the schedule and curves for such prices. What is meant by demand at such negative prices?

Ch. XVI. § 2

Draw up a list of reasons why one person's subjective estimate of a good may vary from that of another person. (*O.*)

Ch. XVI. § 5

Taking the schedule in the book and assuming that the market price of coal is $5 per ton, compare the *marginal* desirabilities of coal to the two persons. Do the same for a price of $4 per ton; $6.

Rewrite the *price* schedules on pages 289 and 290, taking as the unit of desirability the desirability of a dollar to No. II. Which columns in the two tables will remain unchanged? Rewrite the schedules, taking as the unit of desirability the desirability of the third ton to No. I (and also of course to No. II, since the two are assumed to have equal desirabilities of coal). Frame a different schedule for No. II, assuming that his desire for coal, instead of being always equal to that of No. I (for the same quantity), is always twice as intense (but still assuming that his desire for a dollar is twice that of No. I). Note the resulting similarity in the demand schedule. Explain.

Ch. XVI. § 7

We know that, although practically all men desire larger incomes than they have, some are more easily satisfied than others. Contrast the curves indicating their marginal desirabilities of money. Which will descend fastest? Suppose a curve of marginal desirability of money should meet the horizontal or X axis; what would this mean? Suppose a man to have desire only for necessary food, clothing and shelter and little desire for luxuries. What sort of a curve of marginal desirability of money would he have? The curve of marginal desirability of money above considered expresses the relation between the *money value of one's income* and his marginal desirability of money. Could you draw a curve to indicate the relation between the *money carried in one's pocket* and his marginal desirability of money? Would the latter curve necessarily be of the same form as the former? Do either of these curves represent the relation between the amount of money in circulation and its purchasing power? In which of these three cases is the purchasing power of money supposed to remain constant and in which to vary?

"I am not convinced of the soundness of the orthodox doctrine that a country can have all the money it wants and needs, just as it can have all the engines, machinery, etc., which it wants. Money is very different from other things. It would be easy to give a man all the food and clothes he wants; but, however much money you offered him, he would take it all gladly."

Criticise by distinguishing carefully the three relations above mentioned. (*T.*)

Ch. XVII. § 1

Extend the first schedule and curve of § 1 in both directions by supposing illustrative figures.

Ch. XVII. § 2

Draw *rr'* and, assuming a particular price, draw *mm'* descending and find the supply of the individual which corresponds to that particular price, thus locating one particular point in the supply curve.

Assuming another (say higher) price, reconstruct the entire figure and find a second point on the supply curve. Will *rr'* in the second construction be the same as before? Will *mm'*? Will *mm'* begin at the same point at the left? Will it descend more or less rapidly?

Assuming other prices, obtain the resulting supply curve.

Ch. XVII. § 8

Suppose the fixed expenses are $200,000 a year; the *general* running expenses, $100,000 a year; and the *particular* running expenses, $1 per pair of shoes. What is the marginal cost? What is the average cost if the output is 1 pair; 100; 1000; 10,000; 100,000; 1,000,000? What is the total cost in all these cases? What is the total cost if the factory is idle?

Revise the results by assuming, to be closer to the facts of life, that the general running expenses slightly increase with an increase in output, while the particular running expenses per pair slightly decrease with an increase in output.

Ch. XVII. § 9

Illustrate graphically "charging what the traffic will bear" by assuming a demand curve for mineral waters and a monopolist owner of the mineral springs which yield this mineral water. Assume first that there is no cost of production.

Show how the results will be modified if there is a cost of production, increasing or decreasing.

Ch. XVIII. § 2

"If the wheat crop of the world should fall off one-half next year, a rise in price would then be of great social advantage, in fact, almost indispensable." Explain. (*T.*)

Ch. XVIII. § 5

Would a sudden and large increase in the demand for beef affect the supply of hides; of shoes; of harness? (*O.*)

Ch. XIX. § 1

"The present rise in the cost of living cannot be due to any abundance of money; for such abundance would make money cheap and it is, as a matter of fact, dear." Criticise.

Ch. XX. § 2

"To-day, all over the land, masons, hod carriers, carpenters, and so on, are building palaces which other people are to live in. When socialism triumphs, all this will be changed. The worker, no longer robbed of the fruits of

his labor, will himself occupy the palaces he builds, wear the broadcloth he makes, and eat the choice viands he produces."

(*a*) Does justice require that the worker shall have the right to consume the particular object which he expends effort on? Explain.

(*b*) If it did, would the *particular* set of workers,—masons, hod carriers, carpenters, and so on,—who construct the palace, have the exclusive right to enjoy it? Explain.

(*c*) Show that others besides the "workers" here mentioned have supplied conditions necessary to the existence of the palace. (*T.*)

Ch. XXI. § 3

Suppose that it were suddenly announced to a poor man that he had fallen heir to a large estate and would come into possession in one year. What effect would this news have on his degree of impatience for income; on his desire to borrow?

Suppose a son who had confidentially expected a large bequest from his father discovers when the will is read that he has been disinherited. What effects would this news have on his valuations of present and future income?

If under socialism all interest were forbidden, what transactions would be affected? What do you think would be the result?

Ch. XXIII. § 2

Suppose all land to be occupied. Would the rent of any particular land then necessarily be measured by its excess in productivity over the worst land? Would there necessarily be any no-rent land? Are the conditions in this example ever or often realized in practice? Consider, as a case very close to that supposed, a fertile alluvial valley bounded by rapidly ascending slopes of rapidly diminishing fertility.

"All land is subject to the law of diminishing returns. Consequently every increase in population means that *the margin of cultivation has to be pushed lower*, that the food of the masses costs more than before, and so the amount of poverty ever increases."

Objector. "Such talk is all nonsense. There is no law of diminishing returns. It costs less to raise a bushel of wheat now than it did a hundred years ago. The real trouble is that the existence of a right of private property in land causes an ever increasing share of the product of industry to go to landlords in the shape of rent."

(*a*) Explain the meaning of the clause: "the margin of cultivation has to be pushed lower."

(*b*) Does the fact (supposing it to be a fact) that "it costs less to raise a bushel of wheat now than it did a hundred years ago" justify the sweeping statement that there is no law of diminishing returns? Explain.

(*c*) Formulate a proposition which it would justify.

(*d*) If there were no law of diminishing returns in some sense or other, could any of the product go to the landlord as rent? Explain.

(*e*) If the law of diminishing returns were not true even dynamically, could "an ever increasing share of the product of industry go to landlords"? Explain. (*T.*)

Ch. XXIV. § 3

"In 1848–49 the black death carried off from one-third to one-half of England's workingmen. In consequence wages greatly advanced."

(*a*) Explain the advance in wages on the basis of the Law of Supply and Demand, constructing for the purpose imaginary demand and supply schedules.

(*b*) Explain the advance in wages on the basis of Marginal Utility Principle given above.

(*c*) Discuss this statement: "Wages rose because the demand for the laborers who were left had greatly increased." (*T.*)

Would we naturally expect events like the San Francisco earthquake and fire to increase the demand for labor in general? Explain. (*T.*)

" There is just so much work to be done. The entrance of women and children into the field of labor must drive out an equal amount of adult male labor."

Criticise. (There are no doubt objections of real weight to the extension of child and female labor; but this is not one of them.) (*T.*)

Why are opera singers so well paid? Spring poets so ill? What is the test or measure of skill? (*D.*)

Under what conditions could a ditch digger get higher wages than a bookkeeper?

Ch. XXIV. § 4

Why not raise seals in California and fruit in Alaska? (*F.*)

It is often said that the Irishman is a lazy and incapable laborer at home, but fairly, even highly, efficient in America or Australia. Can you suggest some explanation of this? (*T.*)

Ch. XXIV. § 5

" George Rankin is of course a big fool to spend $400 making a mill dam in a creek which is dried up every summer and never has enough water to run an ice cream freezer; but he is doing one good thing,—he is making a whole lot more demand for labor and so a lot more employment for laborers."

Explain fallacy. (*T.*)

Street comment on a cold snap which bursts numerous water-pipes: " Hard on householders, sure enough; but no great loss without some small gain. It's a bonanza for plumbers."

Is that sound? (*T.*)

" One of the most serious objections to the Chinaman is that, even while he stays in this country, he consumes

mostly commodities which must be imported from China; so that his wages go to support, not American, but Chinese industries."

Explain fallacy. (*T.*)

Remarks of a leading Congressman when it was announced that the Canal Commission would purchase supplies wherever they could be secured most cheaply. "The President should be able to see the desirability of purchasing the supplies in this country alone, because thus employment would be given to *American* capital and labor instead of foreign."

Explain fallacy. (*T.*)

The Chicago *Record-Herald* for April 18, 1908, contained the report of an interview with the head of one of America's great universities, wherein various opinions and statements were attributed to King Haakon of Norway. Among these was the following: "I could black my own boots if I wished to; I have done it and therefore know how; but if I did what would become of the people who make a living blacking boots?"

Criticise on the basis of Say's law. (*T.*)

From Marryatt's *Midshipman Easy:*

"Yes, my dear, this is all very well in the abstract, but how does it work?"

"It works well. The luxury, the pampered state, the idleness,—if you please, the wickedness of the rich, all contribute to the support, the comfort, and the employment of the poor. You may behold extravagance,—it is a vice; but that very extravagance circulates money, and the vice of one contributes to the happiness of many."

Criticise. (*T.*)

Ch. XXVI. § 3

"If all the whisky, brandy, gin and other alcoholic drinks in existence were taken out and poured on the ground, there would not be one whit less wealth or value in the

world than before the operation." Is this a correct use of terms? If not, how would you express the same thought? (*T.*)

Ch. XXVI. § 5

Do people sometimes buy a thing at a high price who would refuse to buy at a low price? Why? (*O.*)

Ch. XXVI. § 6

Do goods tend to be less valuable when out of style? Why? (*O.*)

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